

Title (en)  
DISPLAY ASSISTANT DEVICE

Title (de)  
ANZEIGEHILFSVORRICHTUNG

Title (fr)  
DISPOSITIF D'AIDE À L'AFFICHAGE

Publication  
**EP 3759570 A1 20210106 (EN)**

Application  
**EP 19728765 A 20190423**

Priority

- US 201862742892 P 20181008
- US 201862742888 P 20181008
- US 201862743464 P 20181009
- US 2018064449 W 20181207
- US 2018064452 W 20181207
- US 2018064536 W 20181207
- US 2019028601 W 20190423

Abstract (en)  
[origin: WO2020076352A1] In a display assistant device, a speaker is mounted in a waveguide structure which is at least partially disposed beneath a display screen. The waveguide structure is mounted in an exterior housing which includes speaker grills distributed on a plurality of surfaces of the exterior housing, permitting sound waves from the speaker to be projected outside the exterior housing. A cover structure is disposed on top of the waveguide structure to conceal the waveguide structure and speaker within the exterior housing. The cover structure has a tilted bottom surface configured to be suspended above the waveguide structure and to be separated by a first space. Sound waves projected from an upper portion of the speaker are reflected by the tilted bottom surface and are guided through the first space to exit the device from a speaker grill portion located on a rear side of the exterior housing.

IPC 8 full level  
**G06F 1/16** (2006.01); **G06F 1/20** (2006.01); **G06F 3/16** (2006.01); **G06F 21/62** (2013.01); **H04R 1/02** (2006.01); **H04R 27/00** (2006.01)

CPC (source: CN EP US)  
**G02F 1/133308** (2013.01 - US); **G02F 1/133753** (2013.01 - US); **G06F 1/16** (2013.01 - EP); **G06F 1/1605** (2013.01 - EP US); **G06F 1/1626** (2013.01 - US); **G06F 1/1637** (2013.01 - EP US); **G06F 1/1656** (2013.01 - EP); **G06F 1/1658** (2013.01 - EP US); **G06F 1/166** (2013.01 - US); **G06F 1/1671** (2013.01 - EP); **G06F 1/1683** (2013.01 - US); **G06F 1/1686** (2013.01 - US); **G06F 1/1688** (2013.01 - EP US); **G06F 1/1698** (2013.01 - US); **G06F 1/203** (2013.01 - EP); **G06F 3/162** (2013.01 - CN); **G06F 3/167** (2013.01 - CN EP US); **G06F 21/6245** (2013.01 - EP); **G06F 21/83** (2013.01 - US); **G08C 23/02** (2013.01 - CN); **G10L 15/22** (2013.01 - CN); **G10L 15/28** (2013.01 - US); **H04N 7/14** (2013.01 - EP); **H04N 21/4223** (2013.01 - EP); **H04N 21/43615** (2013.01 - EP); **H04R 1/02** (2013.01 - EP); **H04R 1/021** (2013.01 - EP); **H04R 1/023** (2013.01 - EP US); **H04R 1/025** (2013.01 - US); **H04R 1/026** (2013.01 - EP); **H04R 1/028** (2013.01 - US); **H04R 1/34** (2013.01 - EP); **H04R 1/345** (2013.01 - US); **G02F 1/133325** (2021.01 - US); **G02F 1/133761** (2021.01 - US); **G06F 2200/1631** (2013.01 - EP); **H04L 12/282** (2013.01 - US); **H04R 1/345** (2013.01 - EP); **H04R 27/00** (2013.01 - EP); **H04R 2227/003** (2013.01 - EP); **H04R 2227/005** (2013.01 - EP); **H04R 2499/15** (2013.01 - EP US)

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AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)  
BA ME

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**WO 2020076352 A1 20200416**; CN 111708508 A 20200925; CN 112005191 A 20201127; CN 112005191 B 20240625; CN 112262358 A 20210122; CN 112368665 A 20210212; CN 212933505 U 20210409; EP 3695291 A1 20200819; EP 3759570 A1 20210106; EP 3762804 A1 20210113; EP 3782005 A1 20210224; EP 3827322 A1 20210602; EP 3827322 B1 20230524; US 10996717 B2 20210504; US 11209873 B2 20211228; US 11481005 B2 20221025; US 11513565 B2 20221129; US 11604493 B2 20230314; US 11836009 B2 20231205; US 11966261 B2 20240423; US 11994917 B2 20240528; US 2020090662 A1 20200319; US 2020110441 A1 20200409; US 2020110443 A1 20200409; US 2020112786 A1 20200409; US 2021011518 A1 20210114; US 2021191456 A1 20210624; US 2022404864 A1 20221222; US 2023122155 A1 20230420; US 2024160251 A1 20240516; WO 2020060577 A1 20200326; WO 2020076351 A1 20200416; WO 2020076363 A1 20200416; WO 2020076364 A1 20200416; WO 2020076365 A1 20200416

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**US 2018064536 W 20181207**; CN 201880091904 A 20181207; CN 201880094789 A 20181207; CN 201980022673 A 20190424; CN 202010316958 A 20200421; CN 202020607620 U 20200421; EP 18829631 A 20181207; EP 18830096 A 20181207; EP 18830344 A 20181207; EP 19728765 A 20190423; EP 19728777 A 20190424; US 2018064449 W 20181207; US 2018064452 W 20181207; US 2019028601 W 20190423; US 2019028959 W 20190424; US 2019029264 W 20190426; US 201916525360 A 20190729; US 201916596709 A 20191008; US 201916596711 A 20191008; US 201916597745 A 20191009; US 201916651545 A 20190424; US 202117196060 A 20210309; US 202217889683 A 20220817; US 202217948995 A 20220920; US 202318502854 A 20231106